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## CASE REPORT

# Sirolimus-eluting stent implantation for ostial stenosis of left main coronary artery after Bentall operation in aortitis syndrome

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### KEYWORDS

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**Summary** We describe a 66-year-old woman with aortitis syndrome, successfully treated with percutaneous coronary intervention using sirolimus-eluting stent (SES) for ostial stenosis of left main coronary artery after Bentall operation. At one-year follow-up, she had no evidence of restenosis and no clinical events. Stent implantation with SES may be useful for ostial left main coronary stenosis after Bentall operation in selected patients with aortitis syndrome.  
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## Introduction

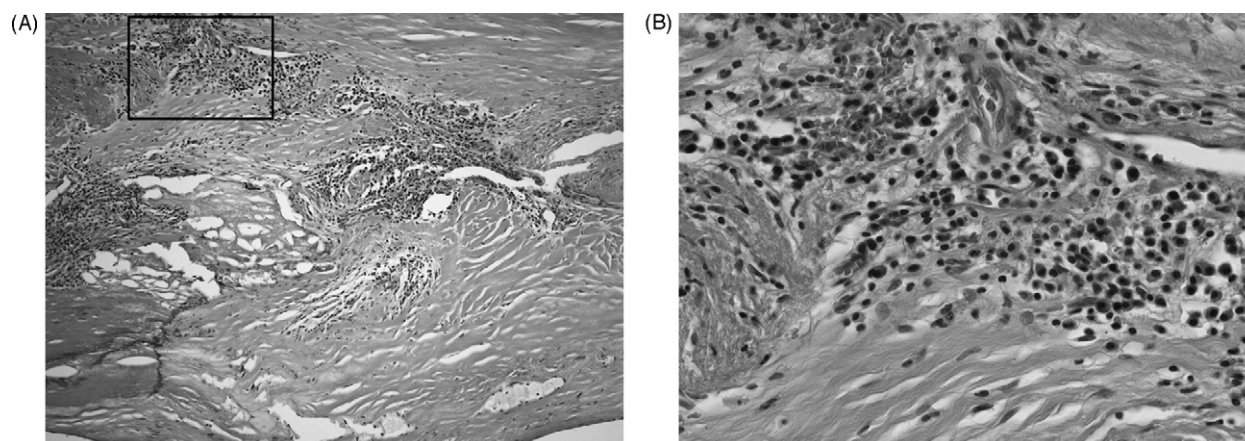
Aorto-ostial stenosis of left main coronary artery after Bentall operation is rare but can be fatal. Aorto-ostial coronary artery lesions complicated with aortitis syndrome are difficult to treat with percutaneous coronary intervention (PCI) because of residual stenosis with balloon angioplasty and high restenosis rate with bare metal stent implantation [1–3]. Recently sirolimus-eluting stent (SES) implantation for unprotected left main coronary artery stenosis has been reported to reduce restenosis and achieve favorable acute and long-term outcomes in selected patients [4,5]. However, the long-term outcome of SES implantation for aorto-ostial stenosis of left main coronary artery in patients with aortitis

syndrome is not well known. We describe a case of aortitis syndrome, successfully treated with PCI using SES for ostial stenosis of left main coronary artery after Bentall operation.

## Case report

A 66-year-old female came to the emergency room of our hospital, because of palpitation and dyspnea on effort. On arrival, she had no symptoms. Her electrocardiogram showed sinus rhythm, and mild ST depression in leads V4–6. Echocardiogram showed good left ventricular wall motion, and no regional wall motion abnormality. However, chest roentgenogram revealed mild pulmonary congestion, and qualitative assessment of troponin T was positive. She was admitted due to suspected unstable angina. She had a history of Bentall operation because of aortic regurgitation and annuloaortic ectasia two years previously. Histologic examination of aortic wall obtained at operation had shown

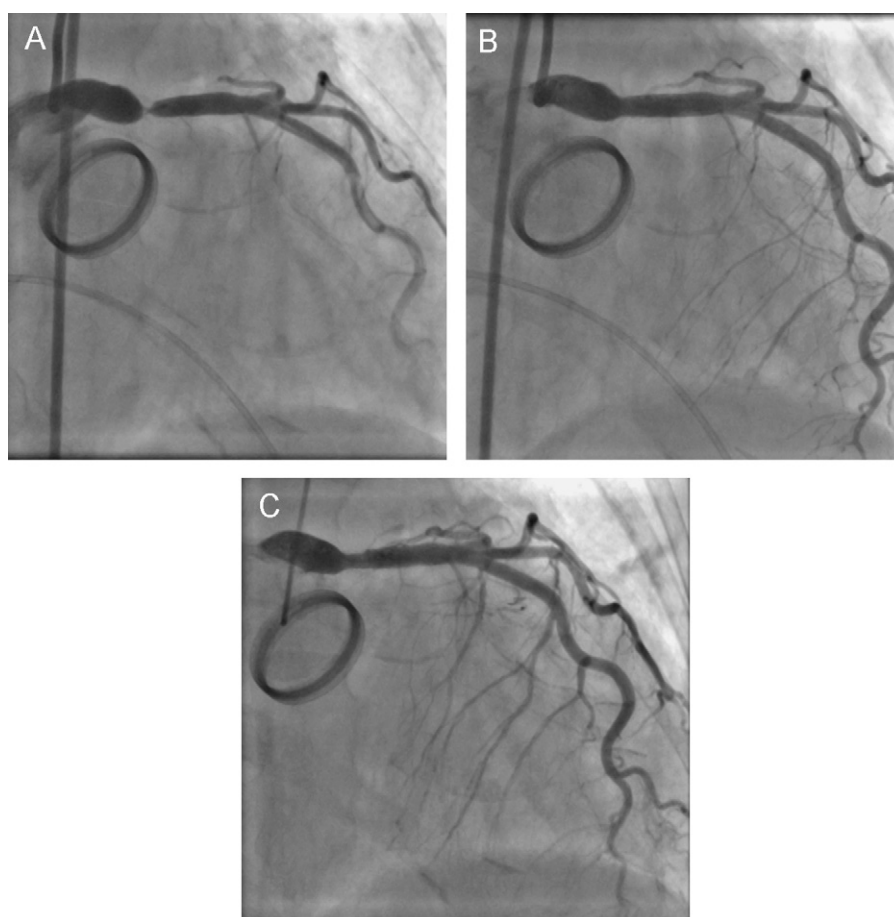
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**Figure 1** Histologic section taken from ascending aortic wall at operation. Low-power view (A) and high-power view (B, boxed area in A) show infiltration of mononuclear cells in the aortic wall.

infiltration of mononuclear cells (Fig. 1), and aortitis syndrome was diagnosed. There were no lesions in the major branches of the aorta. Peripheral pulses were well palpated. Steroid treatment was not performed after operation because her C-reactive protein (CRP) was negative.

Her hospital course was uneventful. She underwent coronary angiography that showed 90% ostial stenosis of left main coronary artery at anastomosis to graft (Fig. 2A). After discussion with the patient, interventionist, and cardiac surgeon, a decision was made to perform PCI.



**Figure 2** (A) Left coronary angiogram before PCI shows localized severe stenosis at the ostium of left main coronary artery. (B) After SES implantation, good results are shown. (C) One-year follow-up coronary angiogram showing no significant restenosis in the left main coronary artery.

The previous histologic examination of aortic wall had shown infiltration of mononuclear cells. CRP on admission was 1.4 mg/dl, and erythrocyte sedimentation rate (ESR) was 61 mm/h. The left main ostial stenosis was thought to be related to the inflammation of aortitis syndrome. PCI was scheduled after the control of inflammation with steroid treatment.

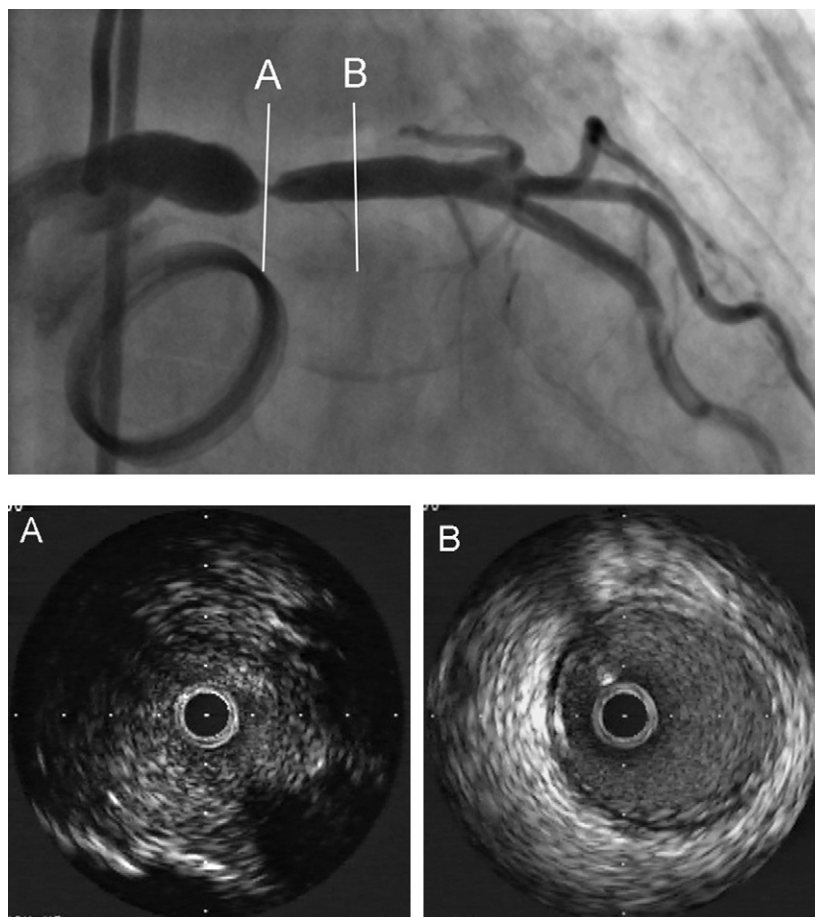
After her CRP and ESR returned to normal, we performed PCI for the ostial stenosis of left main coronary artery. Intracoronary ultrasound imaging before PCI showed intimal thickening localized in the aorto-ostium of left main coronary artery at the anastomosis site, and minimal atherosclerotic change in the remainder of the left main coronary artery (Fig. 3). These findings suggested the stenosis might be mainly due to vascular inflammation, not to atherosclerosis. We used a Cutting Balloon device (4 mm diameter, 10 mm long; Boston Scientific Corporation, San Diego, CA, USA) to predilate the lesion. A high restenosis rate after bare metal stent implantation in patients with aortitis syndrome has been reported previously [1–3], and restenosis of left main lesions might lead to catastrophic events such as sudden death. We chose a SES for the lesion. SES (3.5 mm diameter, 18 mm long; Cypher, Cordis Corporation, Miami, FL, USA) was implanted for full coverage of the lesion, and post-dilated with 5 mm diameter balloon (5.0 mm diameter, 18 mm long; Power Sail, Guidant Corporation, Santa Clara, CA, USA) with intracoronary ultra-

sound guidance. The proximal end of the stent protruded slightly into the graft (approximately 1 mm). Angiography after PCI showed good results (Fig. 2B). During follow-up, steroid therapy was continued, and there were no clinical events. One year after PCI, follow-up angiography showed no significant restenosis (Fig. 2C).

## Discussion

Coronary stenosis after Bentall operation is an extremely rare complication [6,7]. It may be related to the surgical technique. It usually presents as a clinical manifestation within six months after the operation. Delayed ostial coronary stenosis occurring within months of the operation might be due to inflammatory and/or proliferative responses of the coronary wall to tissue glues used at operation [8]. In our case, the stenosis occurred two years after the operation. The cause of aortic disease at operation was aortitis syndrome. Intracoronary ultrasound findings before PCI and the clinical course indicate that the mechanism of the stenosis is related to inflammation of the aortitis syndrome.

There are some reports about PCI for left main coronary artery stenosis in aortitis syndrome, mainly Takayasu's arteritis [1–3,9,10]. PCI with balloon dilatation was limited by high-grade residual stenosis presumably due to recoil. A high restenosis rate precludes the use of bare metal stents



**Figure 3** (A) Intracoronary ultrasound demonstrated intimal hyperplasia localized at the ostium of the left main coronary artery. (B) Minimal atherosclerotic changes are shown in the remainder of the left main coronary artery.

in PCI for Takayasu's arteritis [1–3]. In a few cases, use of drug-eluting stents shows good short- and long-term results [3,9,10]. Vascular inflammation driven by autoimmune reactions may facilitate restenosis after coronary stenting in aortitis syndrome. Sirolimus has immunosuppressive properties and anti-proliferative action on vascular smooth cells. These effects may prevent restenosis of SES in aortitis syndrome. In our case, steroid treatment before PCI, and SES were thought to suppress the inflammatory reaction and to prevent the restenosis.

Unprotected left main coronary artery stenosis is usually treated with coronary artery bypass grafting. However, SES implantation for unprotected left main coronary artery stenosis has been reported to reduce restenosis and achieve favorable acute and long-term outcomes in selected patients with normal left ventricular function [4,5]. With the availability of drug-eluting stents, restenosis is rare for aorto-ostial lesions of left main coronary artery [5]. Her stenosis was in the aorto-ostium. Our case had good left ventricular function. In our case, the left circumflex artery was small, and the right coronary artery was superdominant. Then, we decided to perform PCI for left main coronary artery stenosis, also considering the patient preference for PCI and risk for reoperation.

In conclusion, stent implantation with SES may be useful for ostial left main coronary stenosis after Bentall operation in selected patients with aortitis syndrome.

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